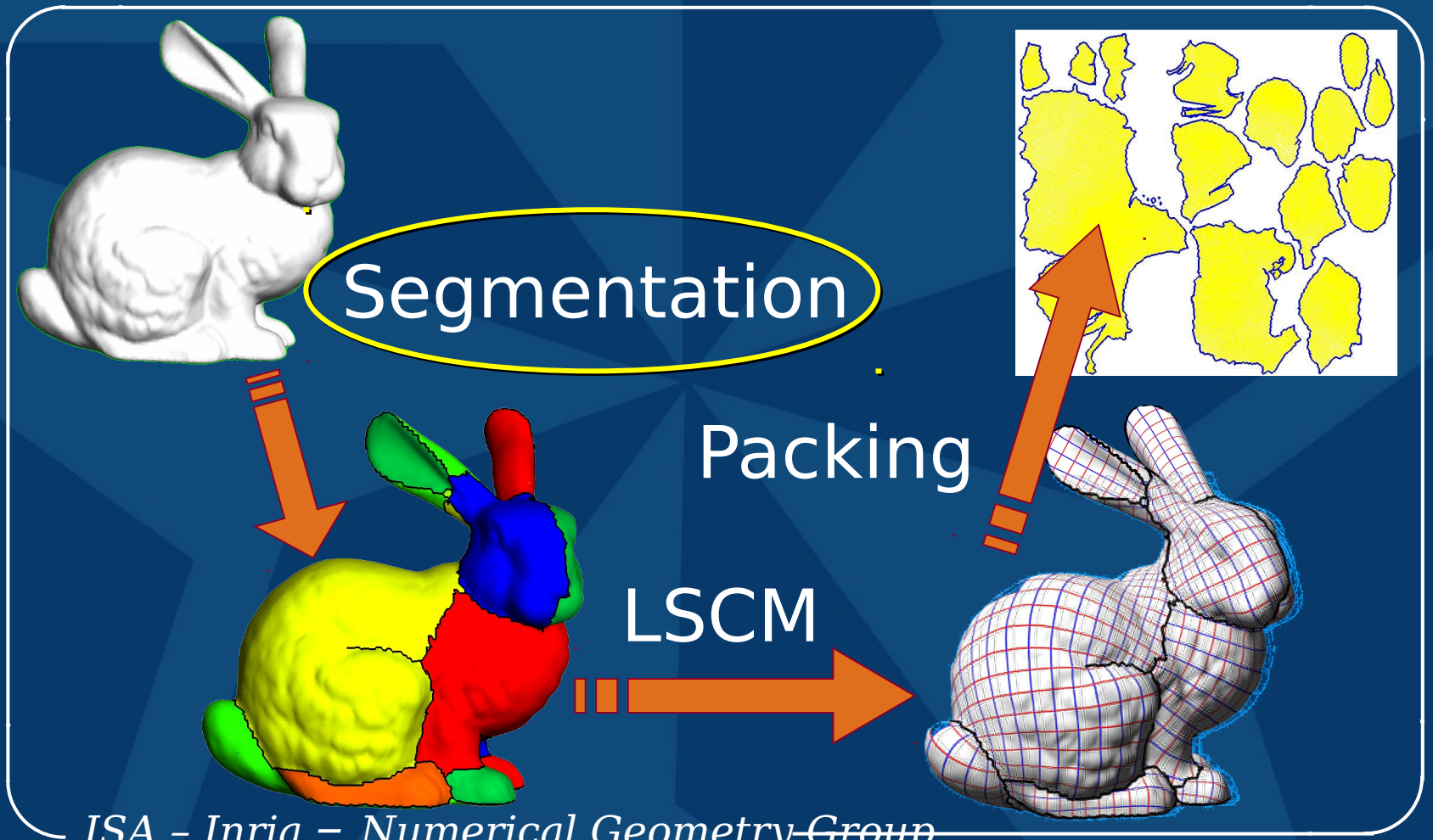
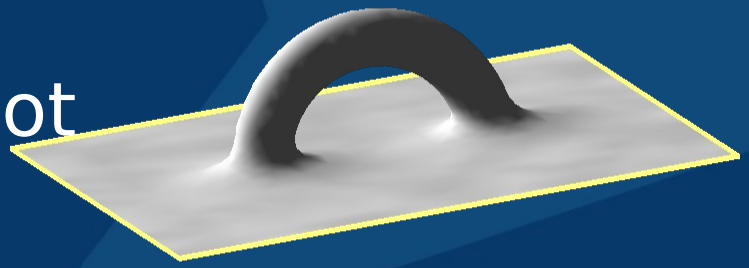
Texture Atlas Generation
Overview

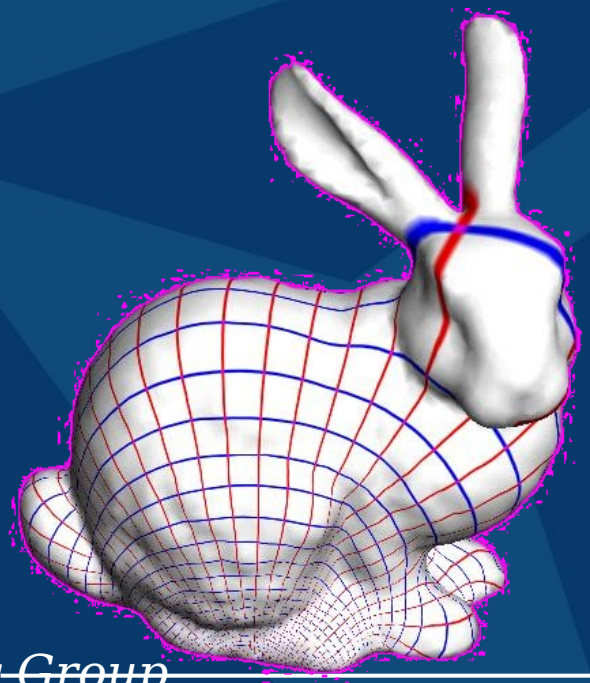


Segmentating into charts
Need for segmentation

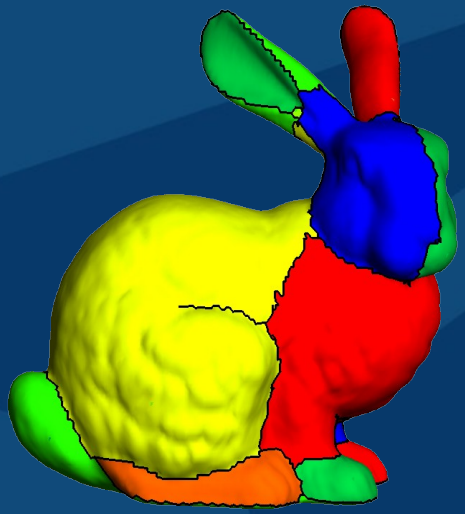
Some surfaces cannot be parameterized (not a disk)



High deformations



Segmenting into Charts Overview



detecting features

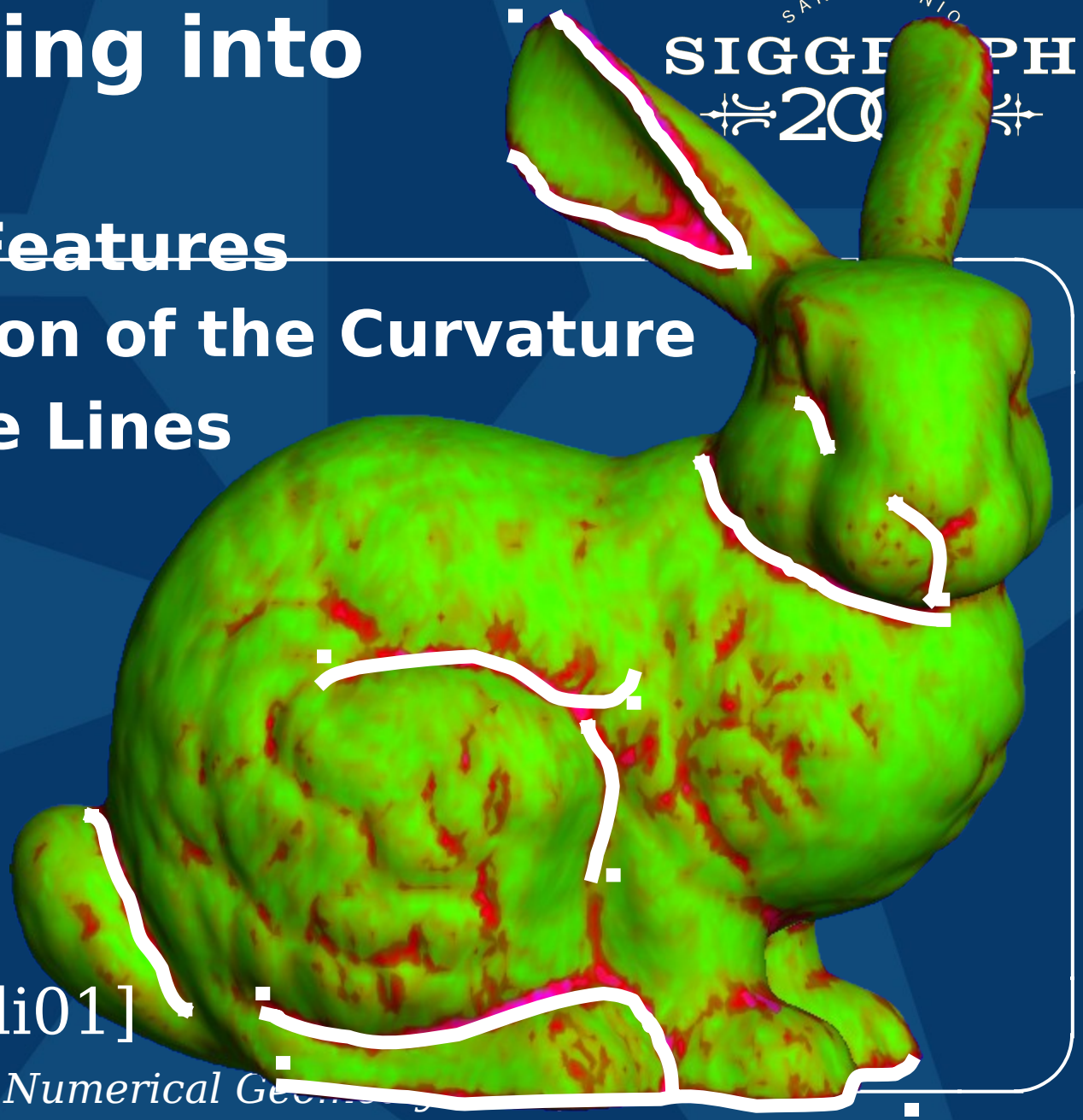
growing the charts

Segmenting into Charts

Detecting Features

Estimation of the Curvature

Feature Lines

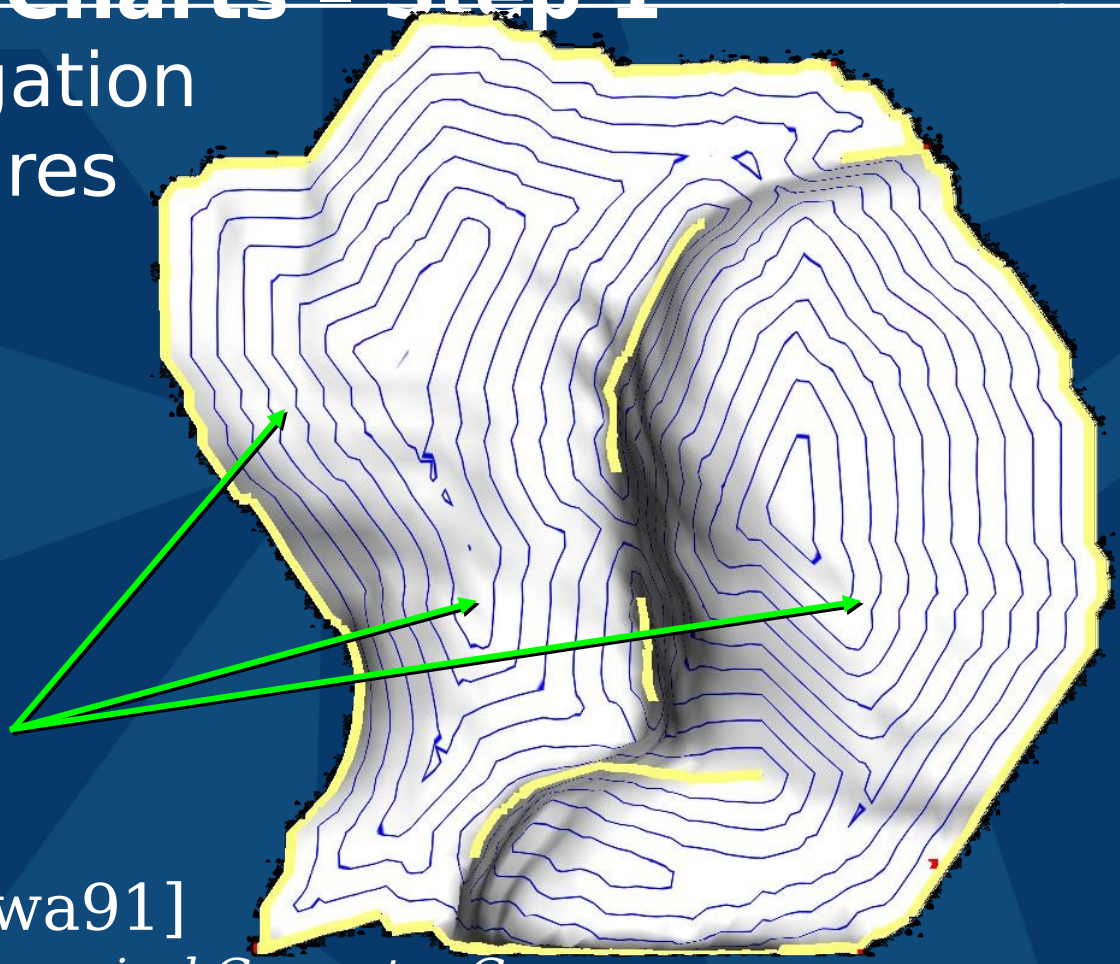


c.f. [Hubeli01]

Segmenting into Charts

Growing the Charts – Step 1

Front propagation from features

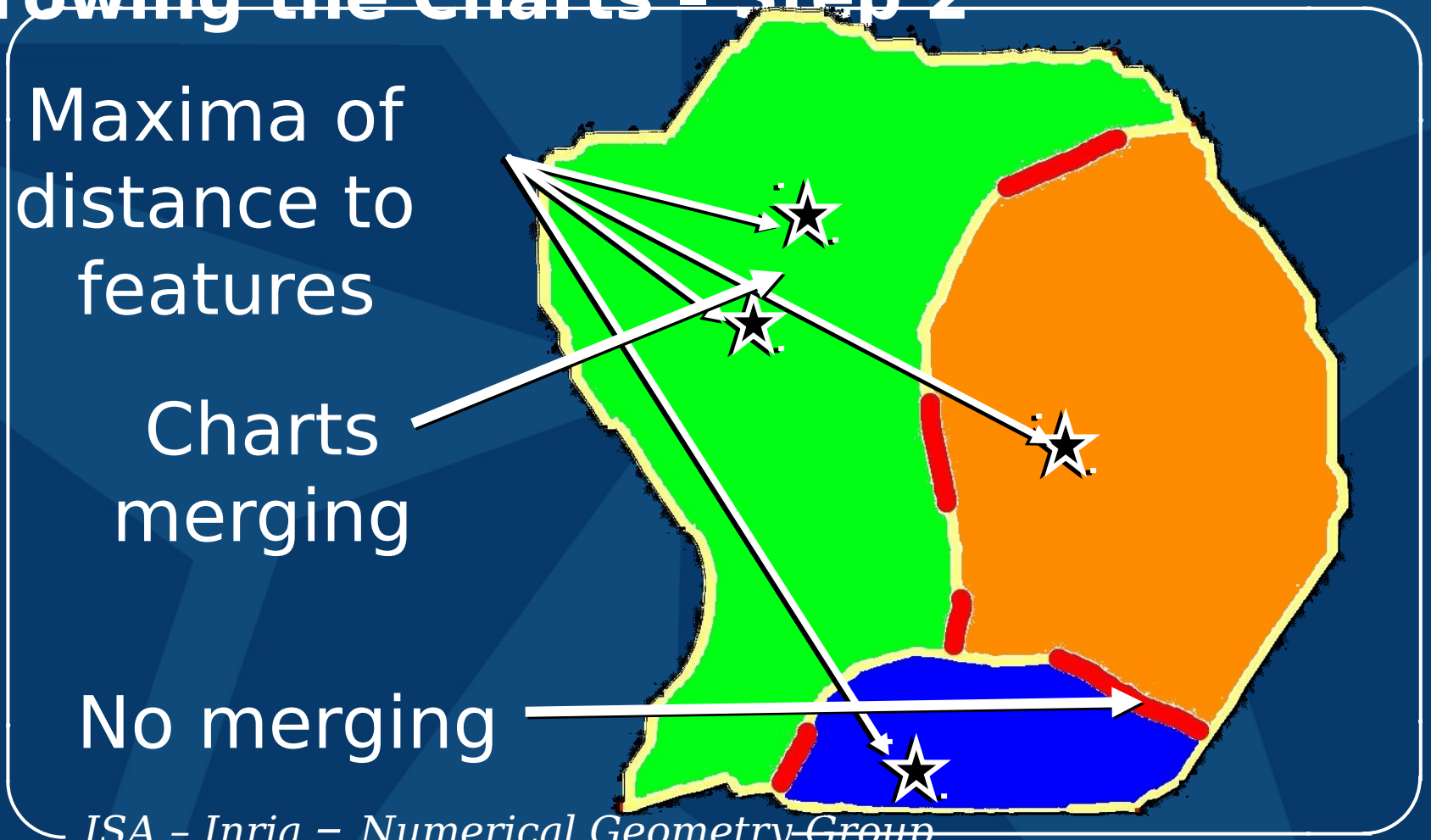


Approx. of distance to features

c.f. [Shinagawa91]

Segmenting Into Charts

Growing the Charts – Step 2



Segmenting the Charts
Post-processing

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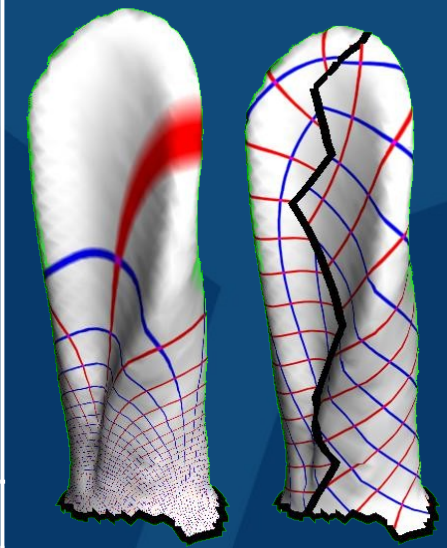
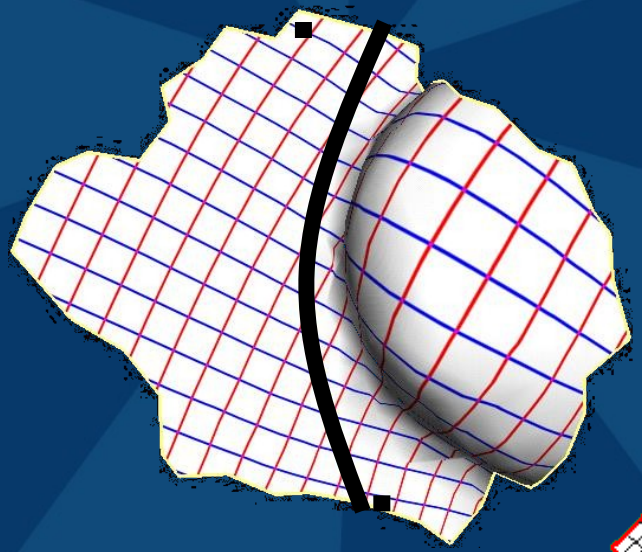
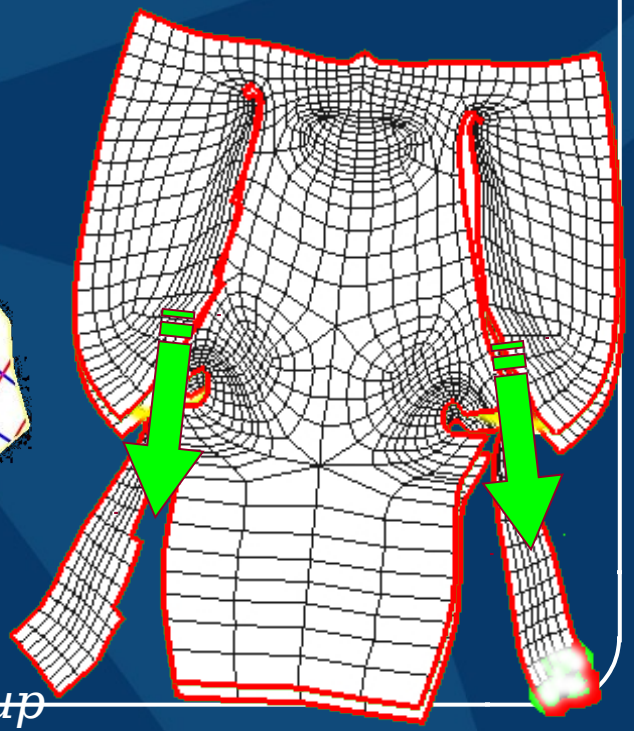
Stretch Optimization [Sander01]

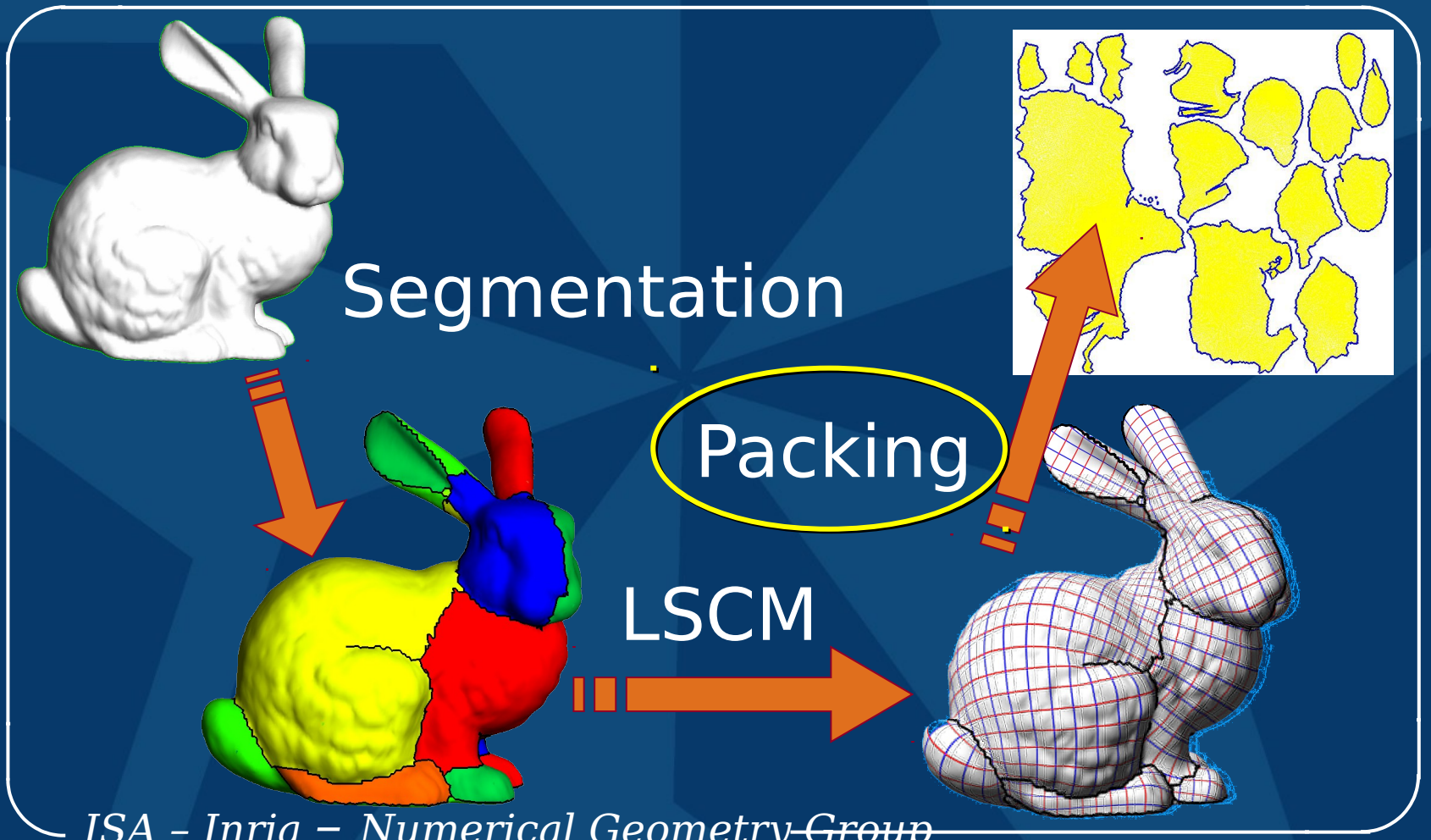
Cut ‘ears’ Split Charts Resolve global overlaps



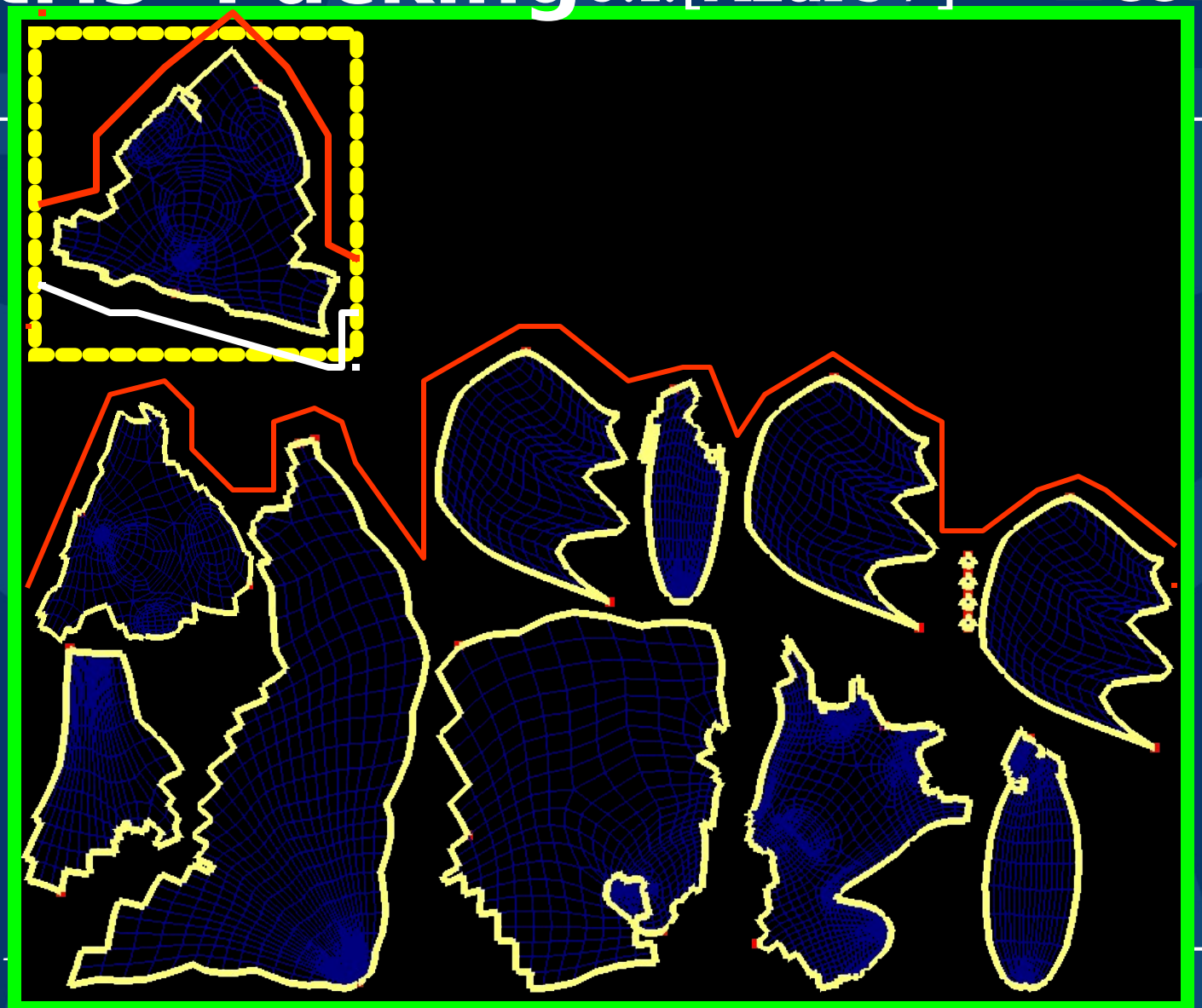




Texture Atlas Generation
Overview



‘Tetris’ Packing c.f.[Azar97]



‘Tetris’ Packing

‘Tetris’ Packing

‘Tetris’ Packing

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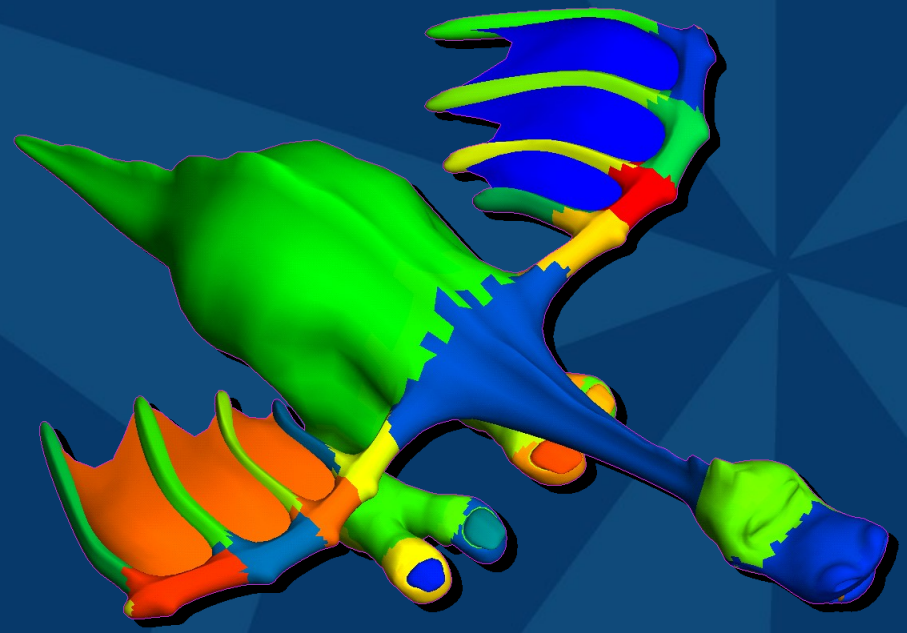

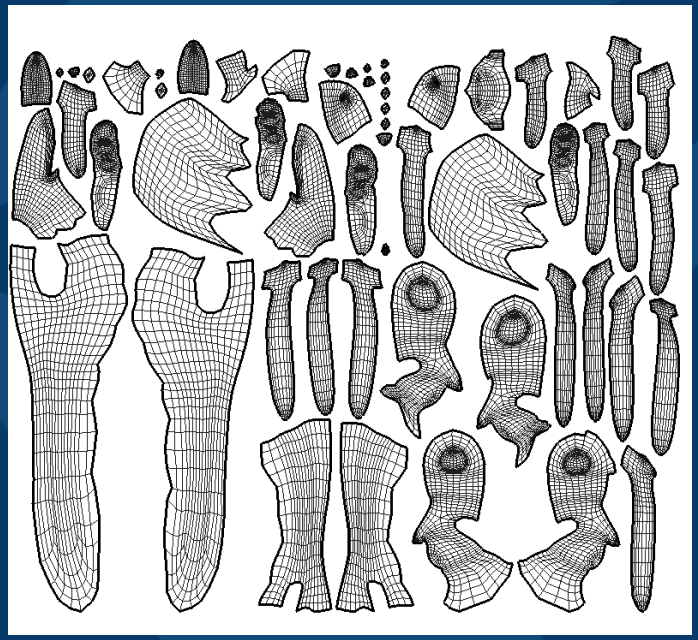

ISA – Inria – Numerical Geometry Group

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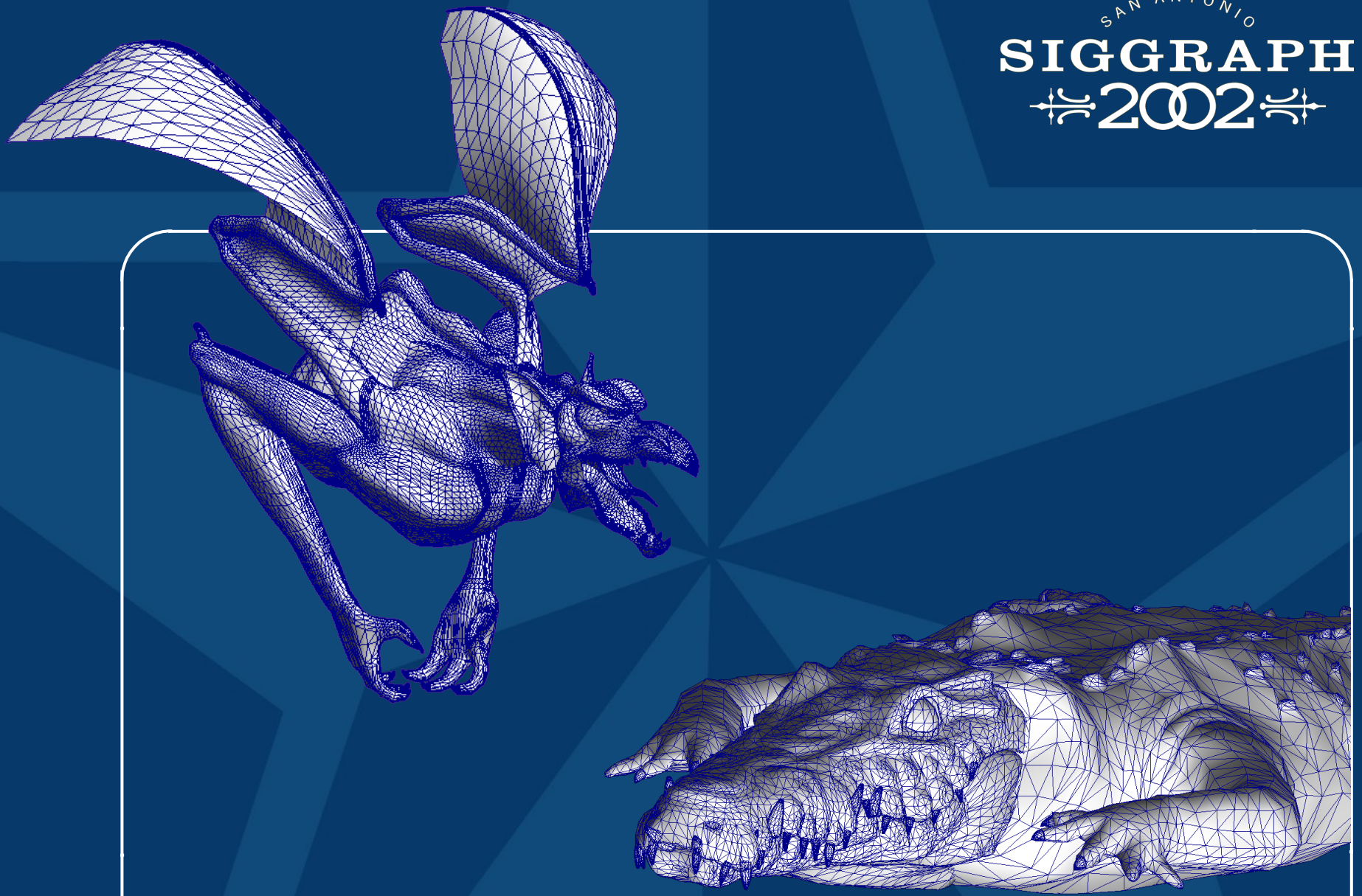

ISA – Inria – Numerical Geometry ~~Group~~

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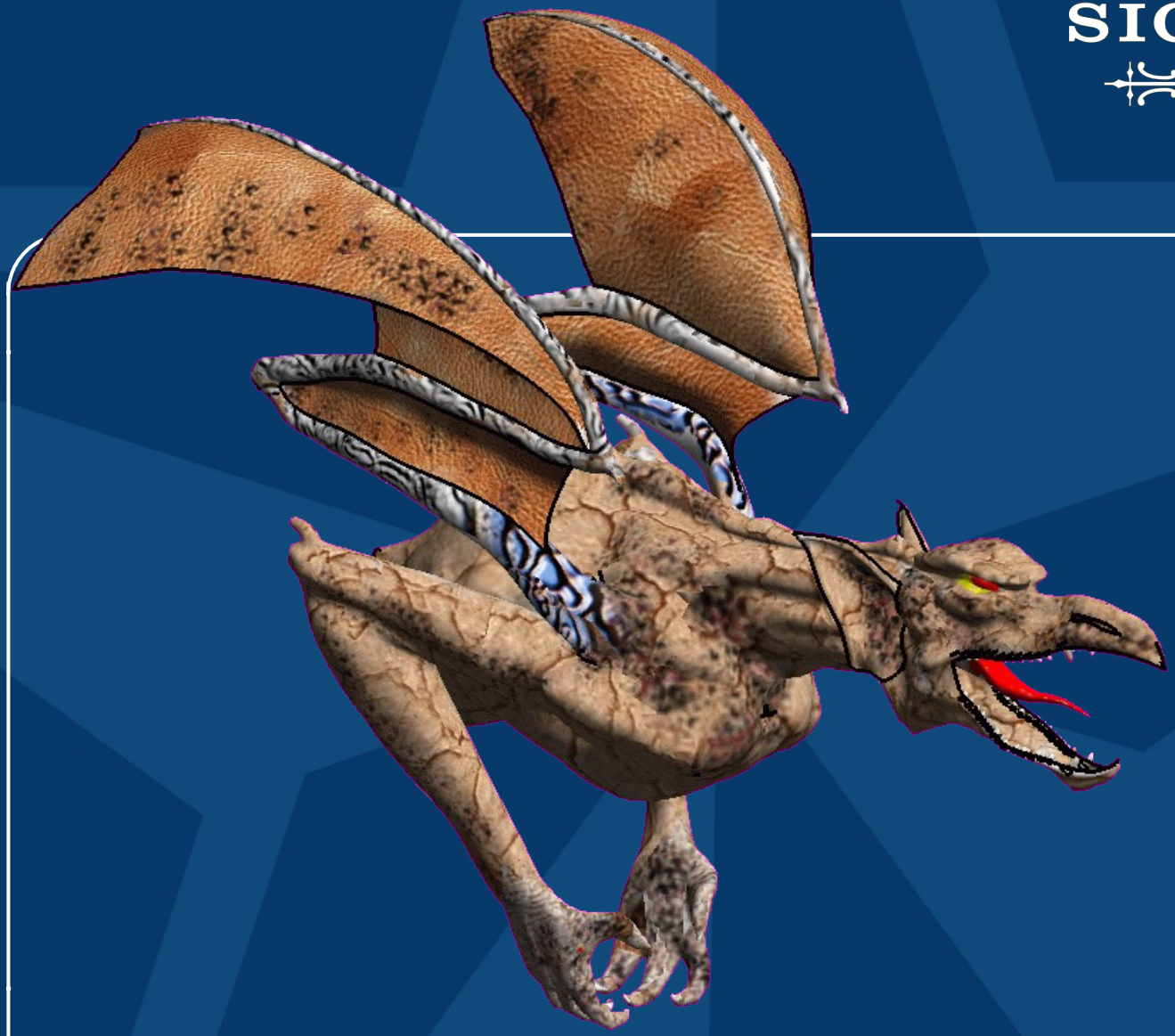
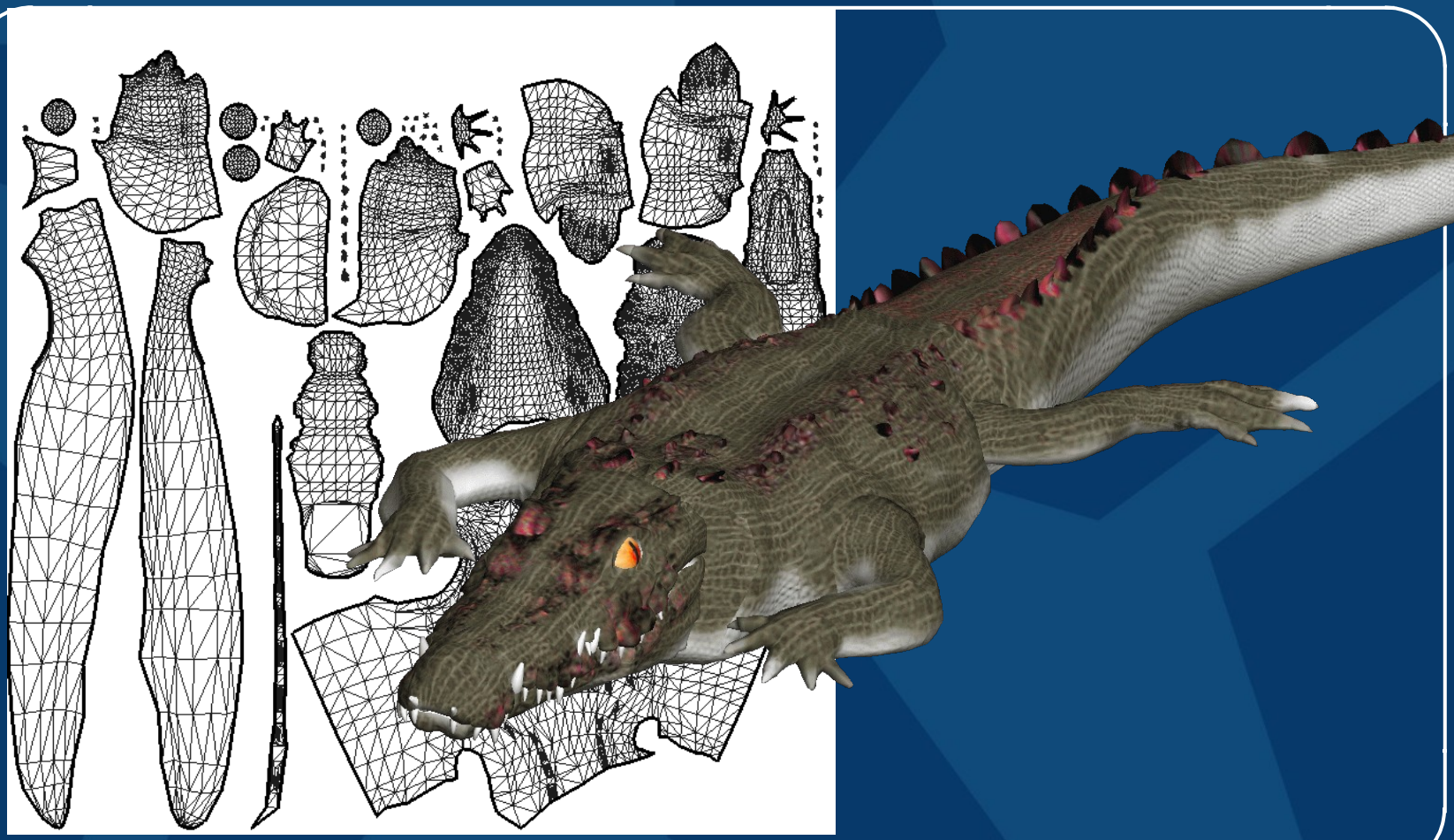
2002



ISA – Inria – Numerical Geometry ~~Group~~

SAN ANTONIO
SIGGRAPH
2002



ISA – Inria – Numerical Geometry ~~Group~~

Conclusion

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- **LSCM**
  - **natural border extrapolation**
  - **expressed as a symmetric linear system**
  - **simple & easy to implement**
- **Segmentation creates natural charts**
- **‘Tetris’ Packing : good heuristic**

Future Work

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- **Tetrahedra -> [Desbrun]**
- **Solvers, link with Multi-resolution**
  - Preconditionners, Multigrid solvers
- **Link with the Gaussian Curvature**
- **Geometric Extrapolation**